Funded Research Projects for FY 92-93

==========

TITLE: Value Enhancement of Barley as a Food and Feed Grain with the Object of Meeting Market Demand - $60,000

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: R.K. Newman
C.W. Newman
C.F. McGuire

COOPERATORS: D.R. Clark Western Plant Breeders
R.T. Ramage USDA/ARS University of Arizona
B.J. Donnell, Northern Crops Institute

FUNDED AMOUNT: $60,000.00

OBJECTIVES:

1) To continue analyzing barley cultivars which are adapted to the various Montana environments in order to determine the most desirable end usage by the food and feed industries.

2) To analyze and test by-products of the barley industry, including pearling flour and bran fractions, for application in breakfast cereals, breads, and health bars.

3) To investigate high-amylose barley cultivars for glycemic index and application in diets for diabetic individuals.

4) To develop reduced-fat sausage-type meat products utilizing high-fiber barley extracts with pork and beef.

==========

TITLE: Spring Wheat Breeding and Genetics - $50,000

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Luther Talbert

PERSONNEL: Susan Lanning, Nancy Blake, Aslam Hayatt, Eric Storlie, Peng Chee

AMOUNT FUNDED: $50,000.00

OBJECTIVES:

1) To develop superior spring wheat varieties for Montana. In particular, we are developing varieties with the following attributes:
   a) Sawfly resistant varieties with superior agronomic and end-use properties.
   b) Varieties for eastern Montana.
   c) Hard white wheat varieties for Montana.
   d) Varieties with combinations of the above attributes.

2) To manage the varietal testing program for spring wheat in Montana.

3) To improve end-use quality of Montana spring wheat.

4) To improve basic knowledge and efficiency of spring breeding and genetics.

==========

TITLE: Winter Wheat Breeding/Genetics - $50,000

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Phil Bruckner, Rhoda Burrows

AMOUNT FUNDED: $50,000.00

OBJECTIVES:

1) Develop improved winter wheat varieties adapted to Montana's diverse growing conditions which meet domestic and export marketing requirements.

2) Test Montana and introduced winter wheat cultivars to obtain data for variety release and formulation of variety recommendations to growers.

3) Pursue wheat breeding, genetics and other research related to winter wheat variety development.

==========

TITLE: Breeding Improved Two-Rowed Barley Cultivars for Montana and Evaluating Early Generation Six-Rowed Germplasm

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Tom Blake, Pat Hensleigh

AMOUNT FUNDED: $50,000.00

OBJECTIVES:

This project is an extension of the regular barley breeding program and its intent is to develop 2-rowed standard quality malting barley varieties which will maintain quality under moisture-stress conditions which will be a value-added product for the Montana producer. Such a development could translate into securing for the barley growers of Montana a growing market share of the developing export market for 2-rowed barley.

==========

TITLE: Evaluation of Cropping Systems -- Research Centers -

INSTITUTION: Montana State University

DEPARTMENT: Research Centers

RESEARCHERS: Various

AMOUNT FUNDED: $42,000.00

OBJECTIVES:

1) To evaluate the effects of differing systems on crop variety performance under the diverse environments represented across the Montana Research Center network.

2) To evaluate the potential fit of other materials, concepts and techniques with various cropping systems employed.

==========

TITLE: Development and Evaluation of Strategies for Management of Russian Wheat Aphid in Montana

INSTITUTION: Montana State University

DEPARTMENT: Entomology

RESEARCHERS: Greg Johnson, Tom Blake, Phil Bruckner, Luther Talbert

AMOUNT FUNDED: $30,000.00

OBJECTIVES:

1) Cereal Breeding Programs
   a) Develop resistant spring and winter wheat varieties that are adapted to Montana.
   b) Develop resistant spring barley varieties adapted to Montana and identify members linked to the genes controlling RWA tolerance.
2) Entomological Investigations
   a) Determine the influence of RWA on wheat/barley grown in three different soil moisture regimes.
   b) Field screening for RWA resistance in spring wheat and barley.
   c) Provide timely information to producers on the status of this pest in Montana.

==========

TITLE: Development of Rust Resistant Wheat and Barley Germplasm for Montana

INSTITUTION: Montana State University

DEPARTMENT: Plant Pathology

RESEARCHERS: Mareike R. Johnston

COOPERATORS: Luther Talbert
Phil Bruckner
Thomas Blake

AMOUNT FUNDED: $20,760.00

OBJECTIVES:

1) Maintain and improve levels of stem rust resistance in

Montana spring and winter wheat cultivars and breeding lines. Provide barley breeding programs with sources of resistance to stem rust.

2) Monitor naturally occurring races of stem rust in Montana.

3) Continue resistance screening for stripe rust of barley in locations where the pathogen occurs naturally. Evaluate segregating populations from crosses of Montana adapted lines with stripe rust resistant materials.

4) Collect and preserve large amounts of inoculum for establishment of screening nurseries and greenhouse work.

==========

TITLE: Selection of Superior Barley Genotypes for Finishing Beef Cattle in Montana

INSTITUTION: Montana State University

DEPARTMENT: Animal Range Sciences

RESEARCHERS: Jan Bowman

COOPERATORS: Roger Brownson, Ray Ansotegui, Darrin Boss, Lisa McKinley, Ken Bryan, Tom Blake

AMOUNT FUNDED: $20,000.00

OBJECTIVES:

1) To compare the structure, granule size and associated physical characteristics of starch in ANT-246, Harrington, and Medallion barleys and corn.

2) To determine the rate of ruminal digestion and percent of starch by-pass from ANT-246 and Harrington barleys compared to that of Medallion barley and corn.

3) To compare ANT-246, Harrington and Medallion barley and corn as basal grains for finishing cattle in terms of feedlot performance and carcass quality.

4) Provide data to barley breeders that may be useful in a barley breeding program to produce superior feed type barley

for ruminants.

==========

TITLE: Equipment Replacement and Acquisition

INSTITUTION: Montana State University

DEPARTMENT: Cereal Quality Lab

RESEARCHERS: R.K. Newman

AMOUNT FUNDED: $19,740.00

OBJECTIVE:

1) Update Cereal Quality Lab Equipment

==========

TITLE: Wheat Stem Sawfly and Hessian Fly Management

INSTITUTION: Montana State University

DEPARTMENT: Entomology

RESEARCHERS: Wendell Morrill (Leader)
Greg Kushnak
Gene Hockett
Gary Jensen
Ronald Larson
Phil Bruckner

AMOUNT FUNDED: $16,000.00

OBJECTIVES:

1) Wheat Stem Sawfly Management
   a) Evaluate new winter wheat lines for stem solidness and sawfly resistance.
   b) Determine effectiveness of tillage for sawfly control.
   c) Measure effects of planting date and seeding rate on sawfly losses.
   d) Identification of new host plant resistance mechanisms for sawfly control.

2) Hessian Fly Management
   a) Identify the destructive Hessian fly biotype in

Yellowstone County.
b) Determine if wheat cultivars currently available in Montana are resistant to Hessian flies.

==========

TITLE: Equipment Startup Package for new Winter Wheat Breeder

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Phil Bruckner
Tom McCoy

AMOUNT FUNDED: $29,800

OBJECTIVES:
1) Development of an anther culture/dihaploid program to facilitate selection and improvement of winter wheat.

2) Microscope for barley genome mapping

==========

TITLE: Marketing and Risk Management Education for Montana Grain Producers

INSTITUTION: Montana State University

DEPARTMENT: Agricultural Economics & Economics

RESEARCHERS: David Bullock (Leader)
Alan E. Baquet
Duane A. Griffith

AMOUNT FUNDED: $7,500

OBJECTIVES:
1) To educate Montana grain producers in basic and advanced risk management and marketing concepts.

2) To educate Montana grain producers in the usage of the computer as a risk management and marketing tool.

==========

TITLE: Evaluation of Progeny from Crosses Between Two

Barley Genotypes Resistant to Barley Yellow Streak Mosaic and Selected Commercial Barley Cultivars - $6,000

INSTITUTION: Montana State University

DEPARTMENT: Plant Pathology

RESEARCHERS: Tom Carroll
Sue Brumfield
Jihad Skaf
Eric Smidansky

COOPERATORS: Tom Blake, Plant & Soils Sciences MSU
Darryl Wesenberg , USDA-ARS

AMOUNT FUNDED: $6,000

OBJECTIVES:
1) Evaluate the progeny derived from crosses made between the two resistant (tolerant) barley genotypes (**CI**ho 734, Haua; **CI**ho 1032, Skinless) and selected commercial barley cultivars and experimental barley lines.

2) If the resistance is heritable, develop resistant barley cultivars suitable for commercial production in Montana.

==========

TITLE: Economic Implications of Expiring Conservation Reserve Program (CRP) Contracts on Montana Wheat and Barley Producers

INSTITUTION: Montana State University

DEPARTMENT: Agricultural Economics & Economics

RESEARCHERS: James B. Johnson (Leader)
Steve Stauber (Leader)
John Saltiel

AMOUNT FUNDED: $6,000

OBJECTIVES:

1) Identify the potential alternative uses of land currently enrolled in the CRP and the factors likely to constrain the development of the alternative uses.

2) Identify the socioeconomic characteristics of CRP contract holders likely to have an impact on the post contract land use decisions.

3) Identify the acceptability of post contract uses/compensation for lands currently in CRP beyond those post contract uses/compensation provided for under existing statute provisions.

==========

TITLE: This proposal is a funding request to assist Northern Montana College in continuing its activities associated with the Northern Tractor Resource Center.

INSTITUTION: Northern Montana College

DEPARTMENT: Tractor Resource Center

RESEARCHERS:

AMOUNT FUNDED: $15,000.00

OBJECTIVES:

1) Continue the development of the Northern Tractor Resource Center.

2) Conduct follow-up tractor tests and consult with individual producers.

3) Conduct additional producer tractor tests and continue AFMRC linkage.

==========